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Detecting neutrinos and measuring nuclear quenching factors with spherical proportional counters

Thursday, March 18, 2021 2:00 PM (20 minutes)

NEWS-G (New Experiments With Spheres-Gas) is a rare event search experiment using Spherical Proportional Counters (SPCs). Primarily designed for the direct detection of dark matter, this technology also has appealing features for Coherent Elastic Neutrino-Nucleus Scattering (CEνNS) studies and, potentially, searches for neutrinoless double beta decay. A study to assess the feasibility of observing CEνNS at a nuclear reactor will be presented.
Both direct dark matter detection and CEνNS consist of nuclear recoils from elastic scatters. The nuclear quenching factor, defined as the ratio of the measured energy induced by a nuclear recoil and an electronic recoil of the same energy, is a property of the target material and must be determined. Nuclear quenching factor measurements in a neon based gas mixture were performed at TUNL (Triangle Universities Nuclear Laboratory) using a neutron beam and preliminary results will be presented.

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